

National Imaging Associates, Inc.*	
Clinical guideline ABDOMEN/PELVIS CT COMBO	Original Date: September 1997
CPT Codes: 74176, 74177, 74178	Last Revised Date: April March 2022¹
Guideline Number: NIA_CG_068	Implementation Date: January 2023²

Note: For syndromes for which imaging starts in the pediatric age group, MRI preferred

Note: CT Abdomen/Pelvis Combo (CPT Codes: 74176, 74177, 74178) is the better study when the indication(s) include both the abdomen AND pelvis, such as CTU (CT Urography), CTE (CT Enterography), acute abdominal pain, widespread inflammatory disease, or neoplasm. Otherwise, the exam should be limited to the appropriate area (i.e., Abdomen OR Pelvis) that includes the specific organ, area of known disease/abnormality or the area of concern.

INDICATIONS FOR ABDOMEN/PELVIS COMPUTED TOMOGRAPHY (CT)

Evaluation of Abdominal and Pelvis Pain for Unknown Etiology

- CT allowed after initial workup is inconclusive and must include results of the following:
 - Initial imaging such as ultrasound (although ultrasound does have limitations, it is a common misconception is that ultrasound is not a good tool in ALL obese patients, such that it is often useful even in obese patients and quite reasonable to attempt as a first line imaging modality particularly given the benefit of no radiation), scope study, or x-ray AND
 - Appropriate laboratory testing (chemistry profile, complete blood count, and urinalysis)
 - Amylase/lipase if suspected pancreatitis
 - Liver function tests if suspicion of hepatic disease
- For acute abdominal pain in a patient over the age of 65^{1, 2} (~~ACR¹ DSH², 2018; Lehtimäki, 2017~~)

Evaluation of suspicious or known mass/tumors (unconfirmed diagnosis of cancer) for further evaluation of indeterminate or questionable findings

- Initial evaluation of suspicious masses/tumors found by physical exam or imaging study, such as ultrasound (US), and both the abdomen and pelvis are likely affected^{3, 4} (~~ACR, 2013, 2014~~)
- ~~New evidence of an unknown primary² (Greco, 2012)~~
- Surveillance: One follow-up exam to ensure no suspicious change has occurred in a tumor in the abdomen and pelvis. No further surveillance CT unless tumor(s) are specified as highly suspicious or a change was found on the last follow-up CT, new/changing sign/symptoms, or abnormal lab values

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1—Abdomen/Pelvis CT

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- For abnormal incidental abdominopelvic lymph nodes when follow-up is recommended based on prior imaging (initial 3-month FU)⁵ (~~Smereka, 2017~~)
- For follow-up of mesenteric panniculitis⁶⁻⁸ (~~Kaya, 2018; McLaughlin, 2013; van Putte-Katier, 2014~~) or lymphadenitis⁹ (~~Helbling, 2017~~) when another diagnosis is suspected after initial imaging or there is a failure of symptom resolution

Evaluation of known cancer^{10, 11} (~~Bourgioti, 2016; NCCN, 2019b~~) (see exception for prostate cancer*)

Initial staging of known cancer

- Follow-up of known cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance ~~docs~~ ([Surveillance Imaging for Cancer Patients from NCCN](#))¹¹
- ~~New evidence of an unknown primary~~^{12, 2}
- ~~Known cancer with suspected abdominal/pelvic metastasis~~ based on a sign, symptom, (e.g., anorexia, early satiety, intestinal obstruction, night sweats, pelvic pain, weight loss, vaginal bleeding) or an abnormal lab value (alpha-fetoprotein, CEA, CA 19-9, p53 mutation)

*Prostate Cancer imaging is indicated for the following scenarios (Pelvis CT +/- Abdomen)

- Initial Staging
 - High Risk and above (T3a or higher, PSA >20[‡], Gleason 8-10)
 - Intermediate Risk (T2b-T2c or PSA 10-20[‡] or Gleason 7) when Nomogram predicts >10% probability of lymph node involvement (MSKCC/Kattan is the nomogram recommended by NCCN 2021)^{11, 13}

[‡]In patients who have been on a 5-alpha reductase inhibitor (such as Proscar) in the past 12 months, an “adjusted PSA” should be used. To adjust, multiply PSA by a factor of 2 (e.g., PSA 6 on finasteride adjusts to a PSA of 12) (initial imaging with CT is not needed for low risk or very low risk prostate cancer (NCCN 2021))^{11, 13}

- Workup of recurrence and/or response to treatment
 - Initial treatment by radical prostatectomy with failure of PSA to fall to undetectable levels or PSA detectable and rising on at least 2 subsequent determinations
 - Initial treatment radiation therapy with post-RT rising PSA or positive digital exam and is candidate for local therapy

For evaluation of suspected infection or inflammatory disease^{14, 15}

(~~ACR, 2013; Cartwright, 2015~~)

- Suspected diverticulitis or acute appendicitis* for initial imaging with at least **ONE** of the following¹⁶ (~~Linzay, 2018~~):
 - WBC Elevated
 - Fever

- Anorexia
- Nausea and vomiting

*Use ultrasound or MRI in pregnant women with suspected appendicitis¹⁷ (ACR, 2018)

• Suspected diverticulitis¹⁸ when

•

○ ~~PO pain is present in the LLQ (<3 months duration), and note documents medical records note~~ [DSJ2] suspicion for diverticulitis, the patient has no prior history of diverticulitis, AND LLQ tenderness is present on exam; OR

○ ~~the patient is immunocompromised; OR~~

○

~~the patient has a history of diverticulitis, and symptoms are similar to prior episodes, AND patient has failed treatment currently (treatment could be liquid diet/anti-inflammatories or antibiotic~~ [WE3] [DSJ4])

○

- Suspected appendicitis in a child (< age 18)¹⁹⁻²³ ~~(AAP, 2019; ACR, 2018; ACS, 2013; Baker, 2020; Sanchez, 2016)~~ when ultrasound is inconclusive or cannot be completed due to body habitus or inability to cooperate [DSJ5] OR- when peritoneal signs are present (guarding, rebound) or other red flags

• ~~Use ultrasound or MRI in pregnant~~ [DSJ6] [WE7] ~~women with suspected appendicitis (ACR, 2018)~~

- For acute non-localized abdominal pain and fever, no recent surgery²⁴ (ACR, 2018)
- For suspected retroperitoneal fibrosis after labs and inconclusive ultrasound²⁵ ~~(Runowska, 2016)~~

For follow-up evaluation of known infection or inflammatory disease involving the abdomen and pelvis^{14, 26}

~~(ACR, 2019; Cartwright, 2015)~~

- Complications of diverticulitis with severe abdominal/pelvic pain or severe tenderness or mass not responding to antibiotic treatment (prior imaging study is not required for diverticulitis diagnosis)^{14, 15} ~~(ACR, 2018; Cartwright, 2015)~~
- Pancreatitis by history (including pancreatic pseudocyst) with continued abdominal pain, early satiety, nausea, vomiting, or signs of infection greater than 4 weeks from initial presentation²⁶ ~~(ACR, 2019)~~ when there is reason to suspect extensive disease extending into the pelvis (otherwise CT abdomen)
- Known inflammatory bowel disease, (Crohn's or ulcerative colitis) with recurrence or worsening signs/symptoms requiring re-evaluation or for monitoring therapy²⁶ (ACR, 2019)
- Any known infection that is clinically suspected to have created an abscess in the abdomen and pelvis
- Any history of fistula that requires re-evaluation or is suspected to have recurred in the abdomen and pelvis
- Abnormal fluid collection seen on prior imaging that needs follow-up evaluation
- Follow-up for known peritonitis (from any cause) if abdominal/pelvic pain and tenderness to palpation is present, and **at LEAST ONE** of the following:
 - Rebound, guarding, or rigid abdomen; **OR**

- Severe tenderness to palpation present over entire abdomen
- For known retroperitoneal fibrosis to determine extent of disease
-

Suspected peritonitis (from any cause) if abdominal pain and tenderness to palpation is present, and at LEAST ONE of the following:

- Rebound, guarding (not voluntary) or rigid abdomen, OR
- Severe tenderness to palpation present over entire abdomen
-

Suspected or known acute pancreatitis²⁶ (ACR, 2019) when have reason to suspect extension beyond abdomen, into pelvis

- For suspected acute pancreatitis with pain and abnormal amylase and lipase and < 48-72 hours, when ultrasound is inconclusive^{26, 27} (ACR, 2019; Vagvala, 2018)
- Suspected acute pancreatitis with atypical signs and symptoms, and when a diagnosis other than pancreatitis may be possible
- Severe acute pancreatitis, 72-96 hours after onset of symptoms²⁸ (Leppaniemi, 2019)
- Known necrotizing pancreatitis requiring follow-up
- Pancreatitis by history, (including pancreatic pseudocyst) with abdominal pain suspicious for worsening, or re-exacerbation
- Known necrotizing pancreatitis requiring follow-up

Suspected inflammatory bowel disease (includes CT enterography)

- For suspected inflammatory bowel disease (Crohn's disease or ulcerative colitis) with abdominal pain **AND** one of the following²⁹⁻³¹ (ACR, 2019; Arif-Tiwari, 2019; Lichtenstein, 2018):

- Chronic diarrhea
- Bloody diarrhea

Note: For patients under 35 years old, consider MRE due to concern for likelihood of the need for repeat imaging in order to reduce potential radiation dose [WE8] [DSJ9] dose³²

- High clinical suspicion after complete work up including physical exam, labs, endoscopy with biopsy^{29-31, 33} (ACR, 2019; Arif-Tiwari, 2019; Lichtenstein, 2018; Rubin, 2019)

- For CT enterography (CTE) if a CT scan is inconclusive [WE10]

For evaluation of hematuria when stone is NOT suspected (includes CT urography (CTU))³⁴⁻³⁶ (ACR, 2019; Davis, 2012; Sharp, 2013)

— For painless, microscopic hematuria (should be

- Documented by greater than 3 red blood cells (RBC) per high-power field on urinalysis and not based on a dipstick test)³⁴ (Davis, 2012) AND ONE or more of the following:

- Age > 60;
- >30+ pack year smoking history; or
- > 25 RBC/hpf (i.e., high risk)

- If not high risk (as above), need equivocal or abnormal renal ultrasound prior to CT

- Gross hematuria

- ~~UA must be negative for infection;~~
- ~~UA can be negative for blood if hematuria is witnessed by patient or provider;~~

- ~~For non-infectious macroscopic or gross hematuria (UA must be negative for infection, however, UA can be negative for blood, if hematuria is witnessed by patient or provider)~~

NOTE: If a previous "routine" CT abdomen/pelvis has been done (with or with/without contrast), and a CTU is later requested, the previous CT must show a clear reason that additional delayed post-contrast images of the collecting system are needed.

For evaluation of known or suspected kidney or ureteral stone in a patient with acute flank pain

- **CT is indicated if one or more of the following is present:**
 - Atypical presentation (i.e., fever or WBC >15,000)
 - Inadequate analgesia
 - Abnormal or indeterminate ultrasound (with findings needing further evaluation with CT)
- **Ultrasound should be performed PRIOR to CT in the following situations (CT is needed only if US is inconclusive or has findings that need further imaging):**
 - Pediatric and pregnant patients (MRU preferred if further imaging indicated)
 - Typical presentation without signs/symptoms of infection in a patient < 65.
- **CT is allowed for acute abdominal pain, in general, for patients >65** [DSJ11][WE12]

Preoperative planning

- CT is indicated when no imaging has been done in the last 30 days, or if passage or movement of stones will change management³⁷ ~~(Assimos, 2016).~~

Postoperative stone follow-up CT

- Symptomatic patients following:
 - Ureteroscopic extraction of an intact stone³⁸ ~~(Fulgham, 2012)~~
 - Ureteroscopy with lithotripsy/fragmentation of a radiolucent stone³⁸ ~~(Fulgham 2012)~~
- Further evaluation of hydronephrosis seen on post-operative ultrasound (following ureteroscopy or ESWL)³⁸ ~~(Fulgham, 2012)~~

For evaluation of pyelonephritis in the following situations

- When other imaging such as ultrasound is abnormal
- For a patient who remains febrile after 72 hours of treatment³⁹ ~~(Bonkat, 2017)~~ or symptoms resolve and then recur within 2 weeks⁴⁰ ~~(Grabe, 2015)~~
- For a complicated patient with history of diabetes, stone disease, prior urinary tract surgery, or who is immunocompromised and is not responding to treatment⁴¹ ~~(ACR, 2018)~~

For evaluation of -Complicated Urinary tract Infection: (see above section for pyelonephritis)

- **Women:-** UTI is considered complicated (and therefore imaging (ultrasound and/or CT) is warranted) in any of the following situations,
 - Immunocompromised host
 - Persistence of bacteria or symptoms after culture specific treatment,
 - Rapid recurrence with same bacteria after treatment,
 - Multidrug resistant bacteria
 - When there is suspicion of renal calculi or obstruction^{39, 42} ~~(Anger 2019; Bonkat 2017)~~
- **Men:** Any UTI is considered complicated due to high likelihood of anatomic abnormalities ~~(Schaeffer, 2016)~~,⁴³ therefore imaging (ultrasound and/or CT) is warranted

Suspected small bowel obstruction when there is a strong clinical suspicion

- Crampy pain, vomiting, distention, high pitched or absent bowel sounds, prior history of abdominal surgery, or based on initial radiograph^{44, 45} ~~(ACR, 2019; Paulson, 2015)~~

Suspected colonic or mesenteric ischemia⁴⁶ ~~(Dhatt, 2015)~~ CTA also appropriate⁴⁷ ~~(ACR, 2018)~~

For suspected small bowel bleeding when endoscopy and capsule endoscopy are inconclusive or negative⁴⁸ ~~(Pasha, 2017)~~

For known or suspected abdominal aneurysm

NOTE: CT/MRI should not be approvable without a contraindication to

CTAngiography/MRAngiography, such as severe renal dysfunction, contrast allergy, or another specific reason CT/MRI (rather than CTA/MRA) is preferred.

- Known or suspected aneurysm > 2.5 cm **AND** equivocal or indeterminate ultrasound results
- Suspected complications of known aneurysm as evidenced by signs/symptoms such as new onset of abdominal or pelvic pain
- Scheduled follow-up evaluation of aorto/iliac endograft or stent (Abd/Pelvic CTA preferred)
- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, e.g., pseudoaneurysms, related to surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity
- Follow-up for post-endovascular repair (EVAR) or open repair of abdominal aortic aneurysm (AAA) or abdominal extent of iliac artery aneurysms. Routine, baseline study (post-op/intervention) is warranted within 1-3 months ~~(Chaikof, 2018; Uberoi, 2011)~~.^{49, 50}
 - Asymptomatic at six (6)-month intervals, for one (1) year, then annually
 - Symptomatic/complications related to stent graft – more frequent imaging may be needed
- Follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

For evaluation of trauma⁵¹

(ACR, 2012) ^(DSH13)

- Suspected retroperitoneal hematoma or hemorrhage based on lab or physical findings
- Blunt injury with suspicion of multisystem trauma and hematuria
- Penetrating abdominal injury with suspicion of multisystem trauma with or without hematuria⁵¹

(ACR, 2012)

For evaluation of a suspected or known hernia

- Abdominal/pelvic pain suspected to be due to an occult, umbilical, Spigelian, or incisional hernia when physical exam and prior imaging is non-diagnostic or equivocal or if requested as a preoperative study
- Hernia with suspected complications (e.g., bowel obstruction or strangulation, or non-reducible) based on symptoms (e.g., diarrhea, hematochezia, vomiting, severe pain, or guarding), physical exam (guarding, rebound) or prior imaging⁵² **(Halligan, 2018)**
- For confirming the diagnosis of a recurrent hernia when ultrasound is negative or non-diagnostic
- Complex ventral hernia that is ≥ 10 cm for pre-operative planning⁵² **(Halligan, 2018)**

Other Indications for Abdomen/Pelvic CT Combo

- To locate a pheochromocytoma once there is clear biochemical evidence
- **Concern for lymphoma/malignancy with** For B symptoms of fevers to more than 101° F, drenching night sweats, and/or unexplained weight loss of more than 10% of body weight over 6 months; **if CXR, labs and an ultrasound of the abdomen and pelvis have been completed** (can also approve chest CT)⁵³ **(Cheson, 2014)**
- Unexplained weight loss of 10% of body weight in two months (patient history is acceptable); with a second MD visit documenting some further decline in weight⁵⁴ **(Gaddey, 2014)**
- Unexplained weight loss of 5% of body weight in six months confirmed by documentation to include the following^{55, 56} **(Bosch, 2017; Wong, 2014)**:
 - Related history and abdominal exam
 - Chest x-ray
 - Abdominal ultrasound
 - Lab tests, must include TSH
 - Colonoscopy if patient fifty plus (50+) years old
- In the workup of a paraneoplastic syndrome after ultrasound, mammography, and appropriate lab tests are completed
- To screen all adult patients with dermatomyositis to rule out occult malignancy⁵⁷⁻⁵⁹ **(Chen, 2010; Dalakis, 2015; Titulaer, 2011)**
- For diffuse, unexplained lower extremity edema with negative or inconclusive ultrasound⁶⁰ **(Hoshino, 2016)**
- For elevation of carcinoembryonic antigen (CEA) in a patient with no cancer history after complete clinical workup (including organ-specific investigations, such as colonoscopy, gastroscopy, mammography, cystoscopy, ultrasound) that fails to demonstrate a reason and CEA is >10 ng/ml, or fails to drop below 5 ng/ml after 3-6 months intervals (see **Background** section)

- For fever of unknown origin (temperature of ≥ 101 degrees for a minimum of 3 weeks) after standard diagnostic tests are negative (see [Background](#) section)⁶¹ ~~(Brown, 2019)~~
- For evaluation of suspected May-Thurner syndrome (CTV/MRV preferred)^{62, 63} ~~(Ibrahim, 2012; Wu, 2012)~~
- For further evaluation of an isolated right varicocele with additional signs and symptoms that suggest malignancy or suspicious prior imaging⁶⁴ ~~(Gleason, 2019)~~

Pre-operative evaluation

- ~~•~~ For abdominal/pelvic surgery or procedure

Post-operative/procedural evaluation

- ~~•~~ Follow-up of known or suspected post-operative complication
- ~~•~~ A follow-up study to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed.

Indication for combination studies for the initial pre-therapy staging of cancer, evaluation before starting treatment OR active monitoring for recurrence as clinically indicated OR evaluation of suspected metastases

- ≤ 5 concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Neck, Abdomen, Pelvis, Chest, Brain, Cervical Spine, Thoracic Spine, or Lumbar Spine, and MUGA

BACKGROUND

CT provides direct visualization of anatomic structures in the abdomen and pelvis and is a fast-imaging tool used to detect and characterize disease. Abdomen/pelvis imaging begins at the diaphragmatic dome through pubic symphysis. CT uses x-rays and multiple detectors to create cross-sectional images of the normal anatomy as well as demonstrate abnormal soft tissue densities, calcifications or fluid/gas patterns in the viscera or peritoneal space.

In general, ionizing radiation from CT should be avoided during pregnancy. Ultrasound is clearly a safer imaging option and is the first imaging test of choice; although, CT or MRI after equivocal ultrasound has been validated for diagnosis. Clinicians should exercise increased caution with CT imaging in children, pregnant women, and young adults due to the risks of exposure to ionizing radiation. Screening for pregnancy as part of a work-up is suggested to minimize the number of unexpected radiation exposures for women of childbearing age.

OVERVIEW

CT Imaging for renal colic and hematuria:

More than 2 million emergency visits in the US are for suspected renal colic, and CT is performed in over 90% of patients diagnosed with kidney stones ~~(Moore, 2019)~~.⁶⁵ Evidence now supports ultrasound or no further imaging in specific clinical scenarios as renal colic is often self-limited. CT can guide

therapy in a subset of patients who require intervention or who have other conditions that mimic renal colic (i.e., appendicitis). CT protocols include: “stone protocol” for detecting urinary tract calculi, “renal mass protocol” for characterizing known renal masses, and CT urography for evaluating hematuria. Non-contrast CT can be used for detecting most ureteral and renal stones but sometimes an intravenous contrast agent is needed to determine the relationship of the calculus to the opacified ureter.

CT imaging for recurrent urinary tract infections:

Imaging in patients without risk factors and less than two infections a year on average and who respond promptly to therapy, is of low yield. Risk factors include but are not limited to: Infection with urea-splitting organism, previous pyelonephritis, history of calculi or obstruction, obstructive symptoms, elevated creatinine, severe diabetes, childhood UTI, neurogenic bladder dysfunction, history of GU surgery, suspected bladder diverticula or urethral, urinary incontinence, pelvic floor dysfunction, post void residual ~~(ACR, 2020)~~.⁶⁶

CT Imaging for abdominal aortic aneurysms:

NOTE: For known or suspected abdominal aneurysm, CT/MRI should not be approvable without a contraindication to CTA/MRA, such as severe renal dysfunction, contrast allergy, or another specific reason CT/MRI (rather than CTA/MRA) is preferred.

If a pulsatile abdominal mass is found in an asymptomatic patient, **abdominal ultrasonography** is an inexpensive and noninvasive technique for **initial evaluation**. For further examination, CT may be performed to better define the shape and extent of the aneurysm and the local anatomic relationships of the visceral and renal vessels. CT has high level of accuracy in sizing aneurysms; however, CTA and MRA are the gold standards for imaging. The majority of evidence regarding AAA surveillance using CT is based on CTA data and is primarily related to contrast bolus timing. Contrast-enhanced CT is well established in the literature and is capable of identifying aortic aneurysms, with many papers discussing incidental AAA identification ~~(ACR 2018)~~.^{67, 68} Risk of rupture in 6 years for an AAA < 4 cm is 1%. For a 4-5 cm AAA, the risk of rupture increases to 1-3% per year and becomes 6-11% per year for AAA 5-7 cm in cross sectional diameter. For any AAA >7 cm, the risk of rupture goes to 7% per year.

Initial evaluation of abdominal aortic aneurysm (AAA)

Initial evaluation of AAA is accurately made by ultrasound. DSJ14

****Abdominal aneurysms and general guidelines for follow-up:**

The normal diameter of the suprarenal abdominal aorta is 3.0 cm and that of the infrarenal is 2.0 cm. Aneurysmal dilatation of the infrarenal aorta is defined as diameter ≥ 3.0 cm or dilatation of the aorta ≥ 1.5 x the normal diameter. ~~Initial evaluation of AAA is accurately made by ultrasound.~~ Ultrasound can detect and size AAA, with the advantage of being relatively inexpensive, noninvasive, and not require iodinate contrast. The limitations are that overlying bowel gas can obscure findings and the technique is operator-dependent.

Recommended intervals for initial follow-up imaging (any modality) of ectatic aortas and abdominal aortas (follow-up intervals may vary depending on comorbidities and the growth rate of the aneurysm)

2.5-2.9 cm:5 yr
3.0-3.4 cm: 3 yr
3.5-3.9 cm:2 yr
4.0-4.4 cm:1 yr
4.5-4.9 cm:6 mo
5.0-5.5 cm:3-6 mo

The Society of Vascular Surgery has different follow-up intervals for AAA⁴⁹ ~~(Chaikof, 2018)~~:

>2.5 cm - <3 cm.....10 yr
3.0 - 3.9 cm.....3 yr
4.0 - 4.9 cm.....12 mo
5.0 - 5.4 cm.....6 mo

The Society of Vascular Surgery recommends elective repair of AAA ≥ 5.5 cm in patients at low or acceptable surgical risk ~~(Chaikof, 2018)~~.⁴⁹

CT for Mesenteric Ischemia

CT of the abdomen and pelvis with intravenous (IV) contrast performed during the venous phase has been less well-studied compared with CTA in diagnosing mesenteric ischemia. CT with IV contrast can assess nonvascular findings, major arterial lesions, and mesenteric veins; however, the lack of arterial phase may lead to suboptimal evaluation of the mesenteric arteries compared to CTA ~~(ACR, 2018)~~.⁴⁷

CT for elevation of CEA with no history of a previous CEA-producing tumor

CEA is not normally elevated after birth, but elevated CEA levels increases the chance of finding colon cancer from 1.3% to 4.6%. It is also a predictor of other diseases, including other cancers (e.g., mucinous adenocarcinomas of the endocervix and ovary, as well as keratinising squamous cell carcinoma of the cervix), diabetes, chronic lung, and liver disease.

Evaluation should begin with a thorough history, including smoking history, and clinical exam. Investigation would include repeat CEA, full blood count, iron, liver function and renal function tests, CA 125 levels, and calcitonin. If CEA <10ng/ml and clinical review is negative, repeat the clinical evaluation in 3 months and CEA for changes. If level falls, repeat at 6-month intervals until normal or 2 consecutive decreases. If CEA level remains above 5 ng/ml after 3-6-month intervals or exceeds 10ng/ml at any stage, consider CT imaging ~~(Hall, 2019)~~.⁶⁹

CT and Fever of Unknown Origin

Initial work up prior to CT would include a comprehensive history, repeated physical exam, complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, CMV IgM antibodies, virus detection in blood, heterophile antibody test, tuberculin test, and HIV antibody test ~~(Brown, 2019)~~.⁶¹

CT and screening for occult malignancy

—In patients with a dermatomyositis, an initial screen with CT chest and abdomen is recommended because large population-based cohort studies report a frequency of 20-25% of malignancy. For the first incidence of unprovoked DVT, there is no indication for screening for occult malignancy (history, blood testing including blood count, calcium, UA, liver function tests, CXR, and age- and gender-specific screening indicated) ~~(Carrier, 2015)~~.⁷⁰ In the case of recurrent DVT, recently a risk score including age >70, chronic lung disease, anemia, elevated platelet count, prior venous thrombosis and recent surgery was designed but still needs external validation before clinical use ~~(Fernandes, 2019; Jara-Palomares, 2017)~~.^{71, 72} Paraneoplastic neurologic syndromes fall into this category. They are rare, often sub-acutely manifesting conditions associated with malignant neoplasms, and they are hypothesized to be immune-mediated. When classic clinical symptoms are present and a high concentration of characteristic anti-neuronal antibodies, there is associated a high probability of malignancy. Small cell lung cancer, thymoma, breast cancer, ovarian cancer and teratoma, and testicular tumors are most common. In paraneoplastic syndrome, screen first for breast cancer with mammography then MRI breast, ovarian teratoma and ovarian cancer with pelvic ultrasound (also CA-125), and for a testicular tumor with ultrasound (also B-HCG and AFP), and if inconclusive follow by CT. Note that tumors may manifest as late as 5 years after the onset of PNS symptoms and further follow-up imaging may be warranted ~~(Sundermann, 2017)~~.⁷³

Combination request of Abdomen CT/Chest CT

—A Chest CT will produce images to the level of L3. Documentation for combo is required.

Evaluation for appendicitis following clinical and laboratory evaluation—

Sonography of the right upper quadrant and pelvis followed by graded compression and color Doppler sonography of the right lower quadrant was used by Gaitini and colleagues as the initial imaging study in 420 consecutive patients referred for emergency evaluation of acute appendicitis. This method correctly diagnosed acute appendicitis in 66 of 75 patients (88%) and excluded it correctly in 312 of 326 patients (96%). It was inconclusive in 19 patients (<5%). Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were 74.2%, 97%, 88%, 93%, and 92%, respectively and comparable to CT ~~(Gaitini, 2008)~~.⁷⁴

Appropriate and timely diagnosis of acute appendicitis is needed. Negative laparotomy rates can range from 16% to 47% when based on clinical and laboratory data alone, while perforation rate can reach 35% when surgery is delayed. Appropriate initial imaging can lower the negative laparotomy rate to 6-10%. Ultrasound has a higher non-diagnostic rate (4%) vs. 0.8% for MDCT. In a prospective study operator experience and patient BMI did not affect diagnostic accuracy ~~(Gaitini, 2008; Keyzer, 2005)~~.^{74, 75}

Consider alternatives to CT imaging in patients with Crohn disease

—In facilities where the technical and clinical expertise exists, MR enterography is emerging as the study of choice (replacing CT) for patients requiring frequent follow-up examinations to determine disease extent or progression. The technique also allows evaluation of extramucosal and extraluminal disease.

Consider the role of capsule endoscopy

—Small bowel capsule endoscopy allows for direct visualization of the mucosa of the small intestine and has been found to be superior to barium studies, CTE and ileocolonoscopy. However, the specificity has been questioned. There is a high negative predictive value of 96%. Also, it may identify a site for selected biopsy to establish a diagnosis.

Lab tests used in diagnosing IBD

—Anti-glycan antibodies are more prevalent in CD than UC, but this test has a low sensitivity. Fecal calprotectin is a helpful test that can help differentiate IBD from irritable bowel syndrome as well as in assessment of disease activity, including response to therapy. Data supports the use of fecal calprotectin to predict relapse in CD. Those who relapsed in one year had significantly higher levels at baseline. Fecal lactoferrin and fecal PMN-elastase are also used for monitoring disease activity in Crohn's ~~(Cappello, 2016)~~.⁷⁶

~~Initial evaluation of abdominal aortic aneurysm (AAA) — Initial evaluation of AAA is accurately made by ultrasound. [DSJ15]~~

Imaging of hernias

—Most hernias are diagnosed clinically with imaging recommended for the diagnosis of occult hernias or in the evaluation of hernia complications, such as bowel obstruction or strangulation. To detect occult hernias, ultrasound is a first-line study with a sensitivity of 86% and specificity of 77%, compared to 80% sensitivity and 65% specificity for CT ~~(Robinson, 2013)~~.⁷⁷ According to Miller, et al "Magnetic resonance imaging is generally not considered a first- or even second-line evaluation modality for hernias..." ~~(Miller, 2014)~~.⁷⁸ Based on this analysis, MRI is recommended only when ultrasound and CT have been performed and fail to make a diagnosis.

POLICY HISTORY

Date	Summary
<u>March 2022</u>	<ul style="list-style-type: none">• <u>Moved "New evidence of an unknown primary" from Evaluation of suspicious or known mass section to Initial staging of known cancer.</u>• <u>Clarified suspected diverticulitis</u>• <u>Added immunocompromised patients to suspected diverticulitis</u>• <u>Added "OR when peritoneal signs are present (guarding, rebound) or other red flags" to suspected appendicitis in a child</u>• <u>Clarified note regarding MRE for patients under 35 years of age</u>• <u>Removed "For CT Enterography (CTE) if a CT scan is inconclusive" from section on Suspected IBD</u>• <u>Clarified evaluation of hematuria</u>

	<ul style="list-style-type: none"> • <u>Clarified concern for lymphoma/malignancy with B symptoms and removed if CXR, labs, and Abd/Pelvis US have been completed</u>
April 2021	<ul style="list-style-type: none"> • Updated prostate cancer imaging section to reflect current NCCN 2021 changes and adjusted PSA • Revised and clarified hematuria when stone is not suspected • Updated known or suspected stone with acute flank pain section to more clearly reflect criteria for when CT imaging is needed • Renamed “recurrent UTI” as “Complicated UTI” and specified definitions and criteria for when imaging is needed for women and when for men
May 2020	<ul style="list-style-type: none"> • Added indication for imaging of new evidence of an unknown primary • FU for abnormal lymph nodes at 3 months • FU mesenteric panniculitis if symptoms fail to improve • Renal colic added no imaging if under 35 and adequate pain relief; if <55 and inadequate relief or abnormal US can image, >55 if no hx of stones or abnormal ultrasound • Pre op for renal surgery or procedure • Post op for symptomatic patients or asymptomatic and abnormal ultrasound • Added imaging for pyelonephritis with complex med hx such as diabetes or prior urinary tract surgery or immunocompromised • Added GL for men with UTI based on age <or>60 • Improved criteria for WU of IBD, added CTE information and imaging for monitoring therapy • Other indications added—for diffuse LE edema with neg or inconclusive US; elevated CEA with no cancer hx, FUO; May-Thurner; isolated right varicocele; Paraneoplastic syndrome; dermatomyositis; acute pain in patient over 65 • Added to comment section on renal colic, recurrent UTI, CEA; Occult malignancy
May 2019	<ul style="list-style-type: none"> • For hematuria, clarified that testing should not be done by dipstick; for infectious hematuria, removed restriction of 6 week completion of antibiotic therapy • Modified indication for prostate cancer imaging when PSA levels ≥ 10 ng/mL per NCCN update • Removed indication for evaluation of organ enlargement; suspected cholecystitis or retained gallstones; hepatitis screening; adrenal mass; ischemic bowel; suspected partial small bowel obstruction • Added indications for known necrotizing pancreatitis; acute flank pain with or without hematuria; pregnant women with suspected appendicitis

	<p>consider US or MRI; blunt injury or penetrating abdominal injury; evaluation of endovascular/interventional abdominal vascular procedures; follow up for post endovascular repair or open repair of abdominal aortic aneurysm; symptoms of fevers, night sweats, unexplained weight loss over 6 months if CXR, labs, and US have been performed</p> <ul style="list-style-type: none"> • Added time frame to Pancreatitis history to include >4 weeks of symptoms
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REFERENCES

- ~~American Academy of Pediatrics (AAP). Avoid CT scan as first-line imaging in suspected appendicitis | Choosing Wisely. Published November 4, 2019. Accessed July 13, 2021. <https://www.choosingwisely.org/clinician-lists/aap-sosu-avoid-ct-scan-as-first-line-imaging-in-suspected-appendicitis/>.~~
- ~~American College of Emergency Physicians (ACEP). Choosing Wisely®. <http://www.choosingwisely.org/clinician-lists/acep-ct-of-abdomen-and-pelvis-for-ed-patients-under-50/>. Published October 27, 2014. Retrieved February 14, 2018.~~
- ~~American College of Radiology (ACR). ACR Appropriateness Criteria®—Acute Pancreatitis. Published 2019.~~
- ~~American College of Radiology (ACR). ACR Appropriateness Criteria®. <https://acsearch.acr.org/list>. Published 2013.~~
- ~~American College of Radiology (ACR). ACR Appropriateness Criteria®. <https://acsearch.acr.org/list>. Published 2014.~~
- ~~American College of Radiology (ACR). ACR Appropriateness Criteria®. <https://acsearch.acr.org/list>. Published 2018.~~
- ~~American College of Radiology (ACR). ACR Appropriateness Criteria*. <https://acsearch.acr.org/list>. Published 2020.~~
- ~~American College of Surgeons (ACS). CT in evaluation of appendicitis in children | Choosing Wisely. Published September 4, 2013. Accessed July 13, 2021. <https://www.choosingwisely.org/clinician-lists/american-college-surgeons-computed-tomography-to-evaluate-appendicitis-in-children/>.~~
- ~~Anger J, Lee U, Ackerman AL, et al. Recurrent uncomplicated urinary tract infections in women. AUA. 2019. Retrieved from <https://www.auanet.org/guidelines/recurrent-uti> Accessed May 13, 2019.~~
- ~~Assimos D, Krambeck A, Miller N, et al. Surgical Management of Stones: AUA/Endourology Society Guideline. *J Urol*. 2016 Oct; 196(4):1153-60.~~
- ~~Baker, RD. Acute Abdominal Pain. Pediatrics in Review. College of Osteopathic Medicine. April 23, 2020.~~
- ~~Becknell B, Schober M, et al. The diagnosis, evaluation and treatment of acute and recurrent pediatric urinary tract infections. *Expert Rev Anti Infect Ther*. 2015; 13(1):81-90.~~

- Bonkat G, Pickard R, Bartoletti R, et al. Guidelines on urological infections. *EAU*. 2017. Retrieved from <https://uroweb.org/wp-content/uploads/Urological-Infections-2017-pocket.pdf>. Accessed May 13, 2019.
- Bosch X, Monclus E, Escoda O, et al. Unintentional weight loss: Clinical characteristics and outcomes in a prospective cohort of 2677 patients. *PLoS One*. April 7, 2017; 12(4):e0175125. <https://doi.org/10.1371/journal.pone.0175125>. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0175125>. Retrieved February 15, 2018.
- Bourgioti C, Chatoupis K, Moulopoulos LA. Current imaging strategies for the evaluation of uterine cervical cancer. *World J Radiol*. April 28, 2016; 8(4):342-354. doi: 10.4329/wjr.v8.i4.342.
- Brisbane W, Bailey MR, et al. An overview of kidney stone imaging techniques. *Nat Rev Urol*. 2016; 13(11): 654-662.
- Brown I, Finnigan NA. Fever of Unknown Origin (FUO). StatPearls (Internet); December 16, 2019.
- Bruix J, Sherman M, American Association for the Study of Liver Diseases. Management of hepatocellular carcinoma: An update. *Hepatology*. March 2011; 53(3):1020-1022. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3084991/>. Retrieved February 13, 2018.
- Cappello M, Morreale GC. The Role of Laboratory Tests in Crohn's Disease. *Clin Med Insights Gastroenterol*. 2016; 9:51-62.
- Carrier M, Lazo-Langner A, et al. Screening for Occult Cancer in Unprovoked venous thromboembolism. 2015; 373:697-704.
- Cartwright SL, Knudson MP. Diagnostic imaging of acute abdominal pain in adults. *Am Fam Physician*. April 1, 2015; 91(7):452-459. <https://www.aafp.org/afp/2015/0401/p452.html>. Retrieved February 7, 2018.
- Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guideline on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. 2018 Jan; 67(1):2-77.
- Chen, Y J, Wu, C Y, Huang Y L, et al. Cancer risks of dermatomyositis and polymyositis: a nationwide cohort study in Taiwan. *Arthritis Res Ther*. 2010; 12(2):R70.
- Choosing Wisely®. Lists. <http://www.choosingwisely.org/clinician-lists/#topic-area=Radiology>. 2020.
- Cheson BD, Fisher RI, Barrington SF, et al. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and Non-Hodgkin Lymphoma: The Lugano Classification. *J Clin Oncol*. 2014; 32(27):3059-67.

~~Coakley FV, Oto A, Alexander LF, et al. ACR Appropriateness Criteria prostate cancer pretreatment detection, surveillance, and staging. JACR. 2017; 14(5 Suppl):S245-S257.~~

~~Dalakas, MC. Inflammatory Muscle Diseases. New Eng J Med. 2015; 373:393-394.~~

~~Darcy M. Evaluation and management of transjugular intrahepatic portosystemic shunts. AJR Am J Roentgenol. 2012 Oct; 199(4):730-6.~~

~~Dariusshnia SR, Haskal ZJ, Midia M, et al. Quality improvement guidelines for transjugular intrahepatic portosystemic shunts. J Vasc Interv Radiol. 2016 Jan; 27(1):1-7.~~

~~Dason S, Dason JT, Kapoor A, et al. Guidelines for the diagnosis and management of recurrent urinary tract infection in women. Can Urol Assoc J. 2011; 5(5):316-322.~~

~~Davis R, Jones JS, Barocas DA, et al. Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults. [Epub October 24, 2012]. J Urol. December 2012; 188(6 Suppl):2473-2481. [http://www.auanet.org/guidelines/asymptomatic-microhematuria-\(2012-reviewed-and-validity-confirmed-2016\)](http://www.auanet.org/guidelines/asymptomatic-microhematuria-(2012-reviewed-and-validity-confirmed-2016)). Retrieved May 15, 2018.~~

~~Dhatt HS, Behr SC, Miracle A, et al. Radiologic evaluation of bowel ischemia. Radiol Clinics North America. 2015; 53(6):1241-1254.~~

~~Farsad K, Kolbeck KJ. Clinical and radiologic evaluation of patients before TIPS creation. AJR Am J Roentgenol. 2014 Oct; 203(4):739-45.~~

~~Fernandes CJ, Morinaga LTK, Alves Jr JL, et al. Cancer-associated thrombosis: the when, how and why. Eur Resp Rev. 2019 Mar 27; 28(151):180119.~~

~~Fontanelle LF, Sarti TD. Kidney stones: Treatment and prevention. Am Fam Physician. 2019; 99(8).~~

~~Fulgham PF, Assimos DG, Pearle MS, et al. Clinical effectiveness protocols for imaging in the management of ureteral calculous disease: AUA technology assessment. J Urol. 2013 Apr; 189(4):1203-13.~~

~~Gaddey HL, Holder K. Unintentional weight loss in older adults. Am Fam Physician. 2014 May 1; 89(9):718-22.~~

~~Gaitini D, Beck-Razi N, Mor-Yosef D, et al. Diagnosing acute appendicitis in adults: Accuracy of color doppler sonography and MDCT compared with surgery and clinical follow-up. AJR Am J Roentgenol. 2008; 190(5):1300-1306. <http://www.ajronline.org/content/190/5/1300.full.pdf+html>.~~

~~Gerson LB, Fidler JL, Cave DR, et al. ACG Clinical Guideline: Diagnosis and Management of Small Bowel Bleeding. Am J Gastroenterol. 2015 Sep; 110(9):1265-87. doi: 10.1038/ajg.2015.246. Epub 2015 Aug 25.~~

Gleason A, Bishop K, Xi Y, et al. Isolated right-sided varicocele: is further workup necessary? 2019 Apr; 212(4):802-807.

Grabe M, Bartoletti TE, Johansen TEB, et al. Guidelines on urological infections. *Eur Assoc Urol*. 2015. Retrieved from https://uroweb.org/wp-content/uploads/18-Urological-Infections_LR.pdf Accessed May 13, 2019.

Greco FA, Osborne OK, et al. Cancer of unknown primary: Progress in the search of improved and rapid diagnosis leading toward upper patient outcomes. *Ann Oncol*. 2012; 23:298-304.

Hall C, Clarke L, Pal A, et al. A review of the role of carcinoembryonic antigen in clinical practice. *Ann Coloproctol*. 2019; 35(6):294-305.

Halligan S, Parker SG, et al. Imaging of complex ventral hernias, their surgical repair, and their complications. *Eur Radiol*. 2018; 28(8).

Harder JN, Hany TF, Von Schulthess GK, et al. Pathologies of the lower abdomen and pelvis: PET/CT reduces interpretation due to urinary contamination. *Clin Imaging*. 2008; 32(1):16-21. <http://www.ncbi.nlm.nih.gov/pubmed/18164389>.

Helbling R, Conficconi E, Wytttenbach M, et al. Acute nonspecific mesenteric lymphadenitis: More than “no need for surgery”. *BioMed Res Int*. 2017; 9784565.

Holder K, Grant D. Unintentional weight loss in older adults. *Am Fam Physician*. 2014; 89(9):718-722.

Hoshino Y, Machida M, et al. Unilateral leg swelling: Differential diagnostic issue other than deep venous thrombosis. *J Gen Fam Med*. 2016; 17(4):311-314.

Ibrahim W, Zakareya AS, et al. Endovascular management of May-Thurner Syndrome. *Ann Vasc Dis*. 2012; 5(2):217-221.

Israel GM, Francis IR, Roach M III, et al. Expert Panel on Urologic Imaging and Radiation Oncology-Prostate. ACR Appropriateness Criteria® Pretreatment Staging Prostate Cancer. *American College of Radiology (ACR)*. 12. <http://www.guidelines.gov/content.aspx?id=15768>. Published 2009.

Jara-Palomares L, Jimenez, D, et al. Development of a risk prediction score for occult malignancy in patients with VTE. *Chest*. 2017; 151:564-571.

Jhang JF, Kuo HC. Recent advances in recurrent urinary tract infection from pathogenesis and biomarkers to prevention. *Tzu Chi Med J*. 2017. 29(3):131-137.

Kaya C, Bozkurt E, et al. Approach to the diagnosis and treatment of mesenteric panniculitis from the surgical point of view. *Turk J Surg*. 2018; 34(2):121-124.

~~Keyzer C, Zalcman M, De Maertelaer V, et al. Comparison of US and unenhanced multi-detector row CT in patients suspected of having acute appendicitis. *Radiology*. 2005;236(2):527-534. doi:10.1148/radiol.2362040984.~~

~~Khosa F, Krinsky G, Macari M, et al. Managing incidental findings on abdominal and pelvic CT and MRI, Part 2: White paper of the ACR Incidental Findings Committee II on vascular findings. *J Am Coll Radiol*. 2013; 10(10):789-794. doi: 10.1016/j.jacr.2013.05.021.~~

~~Krajewski S, Brown J, Phang P, et al. Impact of computed tomography of the abdomen on clinical outcomes in patients with acute right lower quadrant pain: a meta-analysis. *Can J Surg*. February 2011; 54(1):43-53. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3038359/pdf/0540043.pdf>.~~

~~Kranokpiraksa P, Kaufman JA. Follow-up of endovascular aneurysm repair: plain radiography, ultrasound, CT/CT angiography, MR imaging/MR angiography, or what? *J Vasc Interv Radiol*. June 2008; 19(6 Suppl):S27-S36. Retrieved from [http://www.jvir.org/article/S1051-0443\(08\)00282-0/abstract](http://www.jvir.org/article/S1051-0443(08)00282-0/abstract).~~

~~Kroese LF, Sneider D, Kleinrensink GJ, et al. Comparing different modalities for the diagnosis of incisional hernia: A systematic review. *Hernia*. 2018 Apr; 22(2):229-242. doi: 10.1007/s10029-017-1725-5. Epub 2018 Jan 11.~~

~~Kumar Y, Hooda K, Li S, et al. Abdominal aortic aneurysm: Pictorial review of common appearances and complications. *Ann Transl Med*. 2017; 5(12): 256.~~

~~Lassandro F, Iasiello F, Pizza NL, et al. Abdominal hernias: Radiological features. *World J Gastrointest Endosc*. June 16, 2011; 3(6):110-117. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3158902/>. Retrieved February 8, 2018.~~

~~Lehtimäki TT, Valtonen H, et al. A randomised clinical trial of routine versus selective CT imaging in acute abdomen: Impact of patient age on treatment costs and hospital resource use. *Eur J Radiol*. 2017; 87:1-7.~~

~~Leppäniemi A, Tolonen M, Tarasconi A, et al. 2019 WSES guidelines for the management of severe acute pancreatitis. *World J Emerg Surg*. 2019;14:27. doi:10.1186/s13017-019-0247-0.~~

~~Leslie SW, Murphy PB. Renal Calculi. StatPearls (Internet). March 24, 2019.~~

~~Lichtenstein GR, Loftus EV, Isaacs KL, et al. ACG clinical guideline: Management of Crohn's disease in adults. *Am J Gastroenterol*. 2018; 113(4).~~

~~Linzay CD, Pandit S. Acute diverticulitis. StatPearls (Internet). Nov 18, 2018.~~

~~Marquardt JU, Nguyen-Tat M, Galle PR, et al. Surveillance of hepatocellular carcinoma and diagnostic algorithms in patients with liver cirrhosis. *Visc Med*. April 2016; 32(2):110-115. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4926879/>.~~

~~Mathur A, Whitaker A, Kolli H, et al. Acute pancreatitis with normal serum lipase and amylase: A rare presentation. *JOP Journal of the Pancreas*. September 30, 2015. Retrieved from <http://pancreas.imedpub.com/acute-pancreatitis-with-normal-serum-lipase-and-amylase-a-rare-presentation.php?aid=7509>.~~

~~McLaughlin PD, Filiponne A, et al. The “Misty Mesentery”: Mesenteric Panniculitis and its Mimics. *AJR Am J Roentgenol*. 2013 Feb; 200(2):W116-23.~~

~~Miller J, Cho J, Michael MJ, et al. Role of imaging in the diagnosis of occult hernias. *JAMA Surg*. October 2014; 149(10):1077-1080. doi: 10.1001/jamasurg.2014.484. <https://jamanetwork.com/journals/jamasurgery/fullarticle/1893806>. Retrieved February 15, 2018.~~

~~Moore CL, Carpenter CR, Heilbrun ME, et al. Imaging in suspected renal colic: Systematic review of the literature and multispecialty consensus. *J Am Coll Radiol*. 2019; 16(9 Pt A):1132-1143.~~

~~Murphy KP, O'Connor OJ, Maher MM, et al. Adult abdominal hernias. *AJR Am J Roentgenol*. 2014; 202(6):W506-11.~~

~~National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines. 2018.~~

~~National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Prostate Cancer. v2.2019. Fort Washington, PA: NCCN, 2019a. https://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf.~~

~~National Comprehensive Cancer Network (NCCN). NCCN Imaging Appropriate Use Criteria (NCCN Imaging AUC). 2019b. <https://www.nccn.org/professionals/imaging/default.aspx>.~~

~~National Comprehensive Cancer Network (NCCN). Practice guidelines in Oncology v.4.2013. NCCN. Fort Washington, PA. http://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf.~~

~~Neville AM, Paulson EK. MDCT of acute appendicitis: Value of coronal reformations. *Abdomen Imaging*. 2009; 34(1):42-48. doi: 10.1007/s00261-008-9415-5. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18493813>.~~

~~Panizza PS, Viana PCC, et al. Inflammatory Bowel Disease: Current Role of Imaging in Diagnosis and Detection of Complications: Gastrointestinal Imaging. *Radiographics*. 2017; 37(2):701-2.~~

~~Pasha SF, Leighton JA. Evidence-based guide on capsule endoscopy for small bowel bleeding. *Gastroenterol Hepatol (N Y)*. 2017;13(2):88-93.~~

Patil M, Sheth KA, Adarsh CK. Elevated alpha fetoprotein, no hepatocellular carcinoma. *J Clin Exp Hepatol*. June 2013; 3(2):162-164. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3940329/>. Retrieved February 6, 2018.

Paulson E, Thompson WM. Review of Small Bowel Obstruction: The Diagnosis and When to Worry. *Radiology*. 2015; 275(2):332-342.

Pickhardt P, Lawrence E, Pooler B, et al. Diagnostic performance of multidetector computed tomography for suspected acute appendicitis. *Ann Intern Med*. 2011; 154(12):789. Retrieved from <http://annals.org/article.aspx?volume=154&page=789>.

Reese AC, Pierorazio PM, Han M, et al. Contemporary evaluation of the National Comprehensive Cancer Network prostate cancer risk classification system. *Urology*. 2012; 80(5):1075-9.

Robinson A. A systematic review and meta-analysis of the role of radiology in the diagnosis of occult inguinal hernia. *Surg Endosc*. January 2013; 27(1):11-18. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22733195>. Retrieved February 8, 2018.

Rubin DT, Ananthakrishnan AN, et al. ACG clinical guideline: Ulcerative colitis in adults. *Am J Gastroenterol*. 2019; 114:384-413.

Runowska M, Majwesi D, Puszczewicz M. Retroperitoneal fibrosis the state of the art. *Reumatologia*. 2016; 54(5):256-263. Epub 2016 Nov 28.

Sanchez TR, Corwin MT, et al. Sonography of abdominal pain in children. *J Ultrasound Med*. 2016; 35:627-635.

Schaeffer AJ, Nicolle LE. Urinary tract infections in older men. *New Eng J Med*. 2016; 374:562-71.

Seminario J, Aggarwal G, et al. 26-Year-Old Man with Recurrent Urinary Tract Infections. *Mayo Clin Proc*. 2011; 86(6):557-560.

Sharp V, Barnes KT, Erickson BA, et al. Assessment of asymptomatic microscopic hematuria in adults. *Am Fam Physician*. December 1, 2013; 88(11):747-754. Retrieved from <https://www.aafp.org/afp/2013/1201/p747.html>. Retrieved May 15, 2018.

Simons MP, M Smietanski M, H J Bonjer HJ, et al. International guidelines for groin hernia management. *Hernia*. 2018; 22(1):1-165.

Smereka P, Doshi AM, Ream JM, et al. The American College of Radiology Incidental Findings Committee Recommendation for Management of incidental Lymph Nodes: A Single-Center Evaluation. *Acad Radiol*. 2017; 24(5):603-08.

Stephens NJ, Bharwani N, Heenan SD. Prostate cancer staging. *Imaging*. 2008; 20:112-121.

~~Sundermann B, Schroder J-B, et al. Imaging workup of suspected classical paraneoplastic neurological syndromes: A systematic review and retrospective analysis of F-FDG-PET-CT. *Acad Radiol*. 2017; 24:1195-1202.~~

~~Tan CH, Low SC, Thng CH. APASL and AASLD consensus guidelines on imaging diagnosis of hepatocellular carcinoma: A review. *Int J Hepatol*. [Published online April 19, 2011]. 2011; 2011:519783. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3170828/>. Accessed February 14, 2018.~~

~~Thompson IM, Goodman PJ, Tangen CM et al. The influence of finasteride on the development of prostate cancer. *N Engl J Med* 2003; 349: 215.~~

~~Titulaer MJ, Soffietti R, Dalmau J, et al. Screening for tumours in paraneoplastic syndromes: Report of an EFNS task force. *Eur J Neurol*. 2011; 18(19):19-e3.~~

~~Tonolini M, Ippilito S. Cross-sectional imaging of complicated urinary tract infections affecting the lower urinary tract and male genital organs. *Insights Imaging*. 2016; 7(5).~~

~~Tosian JJ, Chappidi M, Feng Z et al. Prediction of pathological stage based on clinical stage, serum prostate-specific antigen, and biopsy Gleason score: Partin Tables in the contemporary era. *BJU Int*. 2017; 119(5):676-683.~~

~~Trotter SC, Sroa N, Winkelmann RR, et al. A global review of melanoma follow-up guidelines. *J Clin Aesthet Dermatol*. September 2013; 6(9):18-26. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780800/>. Accessed February 7, 2018.~~

~~Tzartzeva K, Obi J, Rich NE, et al. Surveillance imaging and alpha fetoprotein for early detection of hepatocellular carcinoma in patients with cirrhosis: A meta-analysis. [Published online ahead of print February 6, 2018]. *Gastroenterology*. May 2018; 154(6):1706-1718.ei. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/?term=Tzartzeva%20K%5BAuthor%5D&cauthor=true&cauthor_uid=29425931. Accessed February 14, 2018.~~

~~Uberoi R, Tsetis D, Shrivastava V, et al. Standard of practice for the interventional management of isolated iliac artery aneurysms. *Cardiovasc Intervent Radiol*. 2011; 34(1):3-13. doi:10.1007/s00270-010-0055-0.~~

~~US Preventive Services Task Force (USPSTF). *Colorectal Cancer: Screening*. 2016. Retrieved from <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening2>. Accessed January 22, 2018.~~

~~Vagvala SH, O'Connor SD. Imaging of abnormal liver function tests. *Clin Liver Dis (Hoboken)*. 2018;11(5):128-134. doi:10.1002/cld.704.~~

~~van Putte Katier N, van Bommel EFH, Elgersma OE, Hendriksz TR. Mesenteric panniculitis: Prevalence, clinicoradiological presentation and 5-year follow-up. *Br J Radiol*. 2014;87(1044):20140451. doi:10.1259/bjr.20140451.~~

~~Vikram R, Sandler CM, Ng CS. Imaging and staging of transitional cell carcinoma: Part 1, upper urinary tract. *AJR Am J Roentgenol*. 2009;192(6):1481-1487. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/19457808>.~~

~~Wong CJ. Involuntary weight loss. *Med Clin North Am*. 2014; 98:625-643. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24758965>. Accessed February 15, 2018.~~

~~Wu W-LM, Tzeng W-S, Wu R-H, et al. Comprehensive MDCT evaluation of patients with suspected May-Thurner syndrome. *American Journal of Roentgenology*. 2012;199(5):W638-W645. doi:10.2214/AJR.11.8040.~~

~~Reviewed / Approved by NIA Clinical Guideline Committee~~

GENERAL INFORMATION

~~It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.~~

Disclaimer: Magellan Healthcare service authorization policies do not constitute medical advice and are not intended to govern or otherwise influence the practice of medicine. These policies are not meant to supplant your normal procedures, evaluation, diagnosis, treatment and/or care plans for your patients. Your professional judgement must be exercised and followed in all respects with regard to the treatment and care of your patients. These policies apply to all Magellan Healthcare subsidiaries including, but not limited to, National Imaging Associates ("Magellan"). The policies constitute only the reimbursement and coverage guidelines of Magellan. Coverage for services varies for individual members in accordance with the terms and conditions of applicable Certificates of Coverage, Summary Plan Descriptions, or contracts with governing regulatory agencies. Magellan reserves the right to review and update the guidelines at its sole discretion. Notice of such changes, if necessary, shall be provided in accordance with the terms and conditions of provider agreements and any applicable laws or regulations.

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- ~~Lehtimäki TT, Valtonen H, Miettinen P, Juvonen P, Paajanen H, Vanninen R. A randomised clinical trial of routine versus selective CT imaging in acute abdomen: Impact of patient age on treatment costs and hospital resource use. *Eur J Radiol.* Feb 2017;87:1-7. doi:10.1016/j.ejrad.2016.11.031~~
- ~~2. Greco FA, Oien K, Erlander M, et al. Cancer of unknown primary: progress in the search for improved and rapid diagnosis leading toward superior patient outcomes. *Ann Oncol.* Feb 2012;23(2):298-304. doi:10.1093/annonc/mdr306~~
- ~~3. Smereka P, Doshi AM, Ream JM, Rosenkrantz AB. The American College of Radiology Incidental Findings Committee Recommendations for Management of Incidental Lymph Nodes: A Single-Center Evaluation. *Acad Radiol.* May 2017;24(5):603-608. doi:10.1016/j.acra.2016.12.009~~
- ~~4. Kaya C, Bozkurt E, Yazıcı P, İdiz UO, Tanal M, Mihmanlı M. Approach to the diagnosis and treatment of mesenteric panniculitis from the surgical point of view. *Turk J Surg.* 2018;34(2):121-124. doi:10.5152/turkjsurg.2018.3881~~
- ~~5. McLaughlin PD, Filippone A, Maher MM. The "misty mesentery": mesenteric panniculitis and its mimics. *AJR Am J Roentgenol.* Feb 2013;200(2):W116-23. doi:10.2214/ajr.12.8493~~
- ~~6. van Putte-Katier N, van Bommel EF, Elgersma OE, Hendriksz TR. Mesenteric panniculitis: prevalence, clinicoradiological presentation and 5-year follow-up. *Br J Radiol.* Dec 2014;87(1044):20140451. doi:10.1259/bjr.20140451~~
- ~~7. Helbling R, Conficconi E, Wyttenbach M, et al. Acute Nonspecific Mesenteric Lymphadenitis: More Than "No Need for Surgery". *Biomed Res Int.* 2017;2017:9784565. doi:10.1155/2017/9784565~~
- ~~8. Bourgioti C, Chatoupis K, Mouloupoulos LA. Current imaging strategies for the evaluation of uterine cervical cancer. *World J Radiol.* Apr 28 2016;8(4):342-54. doi:10.4329/wjr.v8.i4.342~~

9. NCCN Imaging Appropriate Use Criteria™. National Comprehensive Cancer Network (NCCN). Updated 2021. Accessed November 4, 2021. <https://www.nccn.org/professionals/imaging/default.aspx>
10. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Prostate Cancer Early Detection Version 2.2021. National Comprehensive Cancer Network (NCCN). Updated July 14, 2021. Accessed July 20, 2021. https://www.nccn.org/professionals/physician_gls/pdf/prostate_detection.pdf
11. Cartwright SL, Knudson MP. Diagnostic imaging of acute abdominal pain in adults. *Am Fam Physician*. Apr 1 2015;91(7):452-9.
12. Linzay CD, Pandit S. Acute Diverticulitis. StatPearls Publishing. Updated August 11, 2021. Accessed November 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK459316/>
13. American College of Surgeons. Five things physicians and patients should question: Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option. Choosing Wisely Initiative ABIM Foundation. Updated 2021. Accessed November 5, 2021. <https://www.choosingwisely.org/clinician-lists/american-college-surgeons-computed-tomography-to-evaluate-appendicitis-in-children/>
14. American Academy of Pediatrics. Five things physicians and patients should question: Avoid using computed tomography (CT scan) as the first-line imaging modality in the evaluation of suspected appendicitis in children. Choosing Wisely Initiative ABIM Foundation. Updated November 4, 2019. Accessed November 5, 2021. <https://www.choosingwisely.org/clinician-lists/aap-sosu-avoid-ct-scan-as-first-line-imaging-in-suspected-appendicitis/>
15. Baker RD. Acute abdominal pain. *Pediatrics in Review*. 2018;39(3):130-9.
16. Sanchez TR, Corwin MT, Davoodian A, Stein Wexler R. Sonography of Abdominal Pain in Children: Appendicitis and Its Common Mimics. *J Ultrasound Med*. Mar 2016;35(3):627-35. doi:10.7863/ultra.15.04047
17. Runowska M, Majewski D, Puszczewicz M. Retroperitoneal fibrosis—the state-of-the-art. *Reumatologia*. 2016;54(5):256-263. doi:10.5114/reum.2016.63667
18. American College of Radiology. ACR Appropriateness Criteria® Acute Pancreatitis. American College of Radiology. Updated 2019. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69468/Narrative/>
19. American College of Radiology. ACR Appropriateness Criteria® Left Lower Quadrant Pain-Suspected Diverticulitis. American College of Radiology. Updated 2018. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69356/Narrative/>
20. Vagvala SH, O'Connor SD. Imaging of abnormal liver function tests. *Clin Liver Dis (Hoboken)*. May 2018;11(5):128-134. doi:10.1002/cld.704
21. Leppäniemi A, Tolonen M, Tarasconi A, et al. 2019 WSES guidelines for the management of severe acute pancreatitis. *World J Emerg Surg*. 2019;14:27. doi:10.1186/s13017-019-0247-0
22. American College of Radiology. ACR Appropriateness Criteria® Crohn Disease. American College of Radiology. Updated 2019. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69470/Narrative/>
23. Lichtenstein GR, Loftus EV, Isaacs KL, Regueiro MD, Gerson LB, Sands BE. ACG Clinical Guideline: Management of Crohn's Disease in Adults. *Am J Gastroenterol*. Apr 2018;113(4):481-517. doi:10.1038/ajg.2018.27
24. Arif-Tiwari H, Taylor P, Kalb BT, Martin DR. Magnetic resonance enterography in inflammatory bowel disease. *Applied Radiology*. 2019;48(1):9-16.

25. Rubin DT, Ananthakrishnan AN, Siegel CA, Sauer BG, Long MD. ACG Clinical Guideline: Ulcerative Colitis in Adults. *Am J Gastroenterol*. Mar 2019;114(3):384-413. doi:10.14309/ajg.0000000000000152
26. Davis R, Jones JS, Barocas DA, et al. Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline. *J Urol*. Dec 2012;188(6 Suppl):2473-81. doi:10.1016/j.juro.2012.09.078
27. Sharp VJ, Barnes KT, Erickson BA. Assessment of asymptomatic microscopic hematuria in adults. *Am Fam Physician*. Dec 1 2013;88(11):747-54.
28. Assimos D, Krambeck A, Miller NL, et al. Surgical Management of Stones: American Urological Association/Endourological Society Guideline, PART I. *J Urol*. Oct 2016;196(4):1153-60. doi:10.1016/j.juro.2016.05.090
29. Fulgham PF, Assimos DG, Pearle MS, Preminger GM. Clinical effectiveness protocols for imaging in the management of ureteral calculous disease: AUA technology assessment. *J Urol*. Apr 2013;189(4):1203-13. doi:10.1016/j.juro.2012.10.031
30. Bonkat G, Pickard R, Baroletti R, et al. EAU guidelines on urological infections. European Association of Urology (EAU). Updated March 2017. Accessed November 5, 2021. <https://uroweb.org/wp-content/uploads/Urological-Infections-2017-pocket.pdf>
31. Grabe M, Bartoletti R, Bjerkklund Johansen TE, et al. Guidelines on urological infections. European Association of Urology (EAU). Updated March 2015. Accessed November 5, 2021. <https://uroweb.org/wp-content/uploads/18-Urological-Infections-LR.pdf>
32. Anger J, Lee U, Ackerman AL, et al. Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline (2019). American Urological Association (AUA). Updated 2019. Accessed November 5, 2021. <https://www.auanet.org/guidelines/recurrent-uti>
33. Schaeffer AJ, Nicolle LE. CLINICAL PRACTICE. Urinary Tract Infections in Older Men. *N Engl J Med*. Feb 11 2016;374(6):562-71. doi:10.1056/NEJMcpr1503950
34. Paulson EK, Thompson WM. Review of small bowel obstruction: the diagnosis and when to worry. *Radiology*. May 2015;275(2):332-42. doi:10.1148/radiol.15131519
35. American College of Radiology. ACR Appropriateness Criteria® Suspected Small-Bowel Obstruction. American College of Radiology. Updated 2019. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69476/Narrative/>
36. Dhatt HS, Behr SC, Miracle A, Wang ZJ, Yeh BM. Radiological Evaluation of Bowel Ischemia. *Radiol Clin North Am*. Nov 2015;53(6):1241-54. doi:10.1016/j.rcl.2015.06.009
37. American College of Radiology. ACR Appropriateness Criteria® Imaging of Mesenteric Ischemia. American College of Radiology. Updated 2018. Accessed November 5, 2021. <https://acsearch.acr.org/docs/70909/Narrative/>
38. Pasha SF, Leighton JA. Evidence-Based Guide on Capsule Endoscopy for Small Bowel Bleeding. *Gastroenterol Hepatol (N Y)*. Feb 2017;13(2):88-93.
39. Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. Jan 2018;67(1):2-77.e2. doi:10.1016/j.jvs.2017.10.044
40. Uberoi R, Tsetis D, Shrivastava V, Morgan R, Belli AM. Standard of practice for the interventional management of isolated iliac artery aneurysms. *Cardiovasc Intervent Radiol*. Feb 2011;34(1):3-13. doi:10.1007/s00270-010-0055-0
41. Halligan S, Parker SG, Plumb AA, Windsor ACJ. Imaging complex ventral hernias, their surgical repair, and their complications. *Eur Radiol*. Aug 2018;28(8):3560-3569. doi:10.1007/s00330-018-5328-z

42. Cheson BD, Fisher RI, Barrington SF, et al. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: the Lugano classification. *J Clin Oncol*. Sep 20 2014;32(27):3059-68. doi:10.1200/jco.2013.54.8800
43. Gaddey HL, Holder K. Unintentional weight loss in older adults. *Am Fam Physician*. May 1 2014;89(9):718-22.
44. Bosch X, Monclús E, Escoda O, et al. Unintentional weight loss: Clinical characteristics and outcomes in a prospective cohort of 2677 patients. *PLoS One*. 2017;12(4):e0175125. doi:10.1371/journal.pone.0175125
45. Wong CJ. Involuntary weight loss. *Med Clin North Am*. May 2014;98(3):625-43. doi:10.1016/j.mcna.2014.01.012
46. Chen YJ, Wu CY, Huang YL, Wang CB, Shen JL, Chang YT. Cancer risks of dermatomyositis and polymyositis: a nationwide cohort study in Taiwan. *Arthritis Res Ther*. 2010;12(2):R70. doi:10.1186/ar2987
47. Dalakas MC. Inflammatory Muscle Diseases. *N Engl J Med*. Jul 23 2015;373(4):393-4. doi:10.1056/NEJMc1506827
48. Titulaer MJ, Soffietti R, Dalmau J, et al. Screening for tumours in paraneoplastic syndromes: report of an EFNS task force. *Eur J Neurol*. Jan 2011;18(1):19-e3. doi:10.1111/j.1468-1331.2010.03220.x
49. Hoshino Y, Machida M, Shimano Si, et al. Unilateral Leg Swelling: Differential Diagnostic Issue Other than Deep Vein Thrombosis. *Journal of General and Family Medicine*. 2016;17(4):311-314.
50. Brown I, Finnigan NA. Fever of Unknown Origin. StatPearls Publishing. Updated August 25, 2021. Accessed November 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK532265/>
51. Ibrahim W, Al Safran Z, Hasan H, Zeid WA. Endovascular management of may thurner syndrome. *Ann Vasc Dis*. 2012;5(2):217-21. doi:10.3400/avd.cr.12.00007
52. Wu WL, Tzeng WS, Wu RH, et al. Comprehensive MDCT evaluation of patients with suspected May-Thurner syndrome. *AJR Am J Roentgenol*. Nov 2012;199(5):W638-45. doi:10.2214/ajr.11.8040
53. Gleason A, Bishop K, Xi Y, Fetzer DT. Isolated Right-Sided Varicocele: Is Further Workup Necessary? *AJR Am J Roentgenol*. Apr 2019;212(4):802-807. doi:10.2214/ajr.18.20077
54. Moore CL, Carpenter CR, Heilbrun ME, et al. Imaging in Suspected Renal Colic: Systematic Review of the Literature and Multispecialty Consensus. *J Am Coll Radiol*. Sep 2019;16(9 Pt A):1132-1143. doi:10.1016/j.jacr.2019.04.004
55. American College of Radiology. ACR Appropriateness Criteria® Recurrent Lower Urinary Tract Infections in Females. American College of Radiology (ACR). Updated 2020. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69491/Narrative/>
56. American College of Radiology. ACR Appropriateness Criteria® Abdominal Aortic Aneurysm: Interventional Planning and Follow-up. American College of Radiology. Updated 2017. Accessed November 5, 2021. <https://acsearch.acr.org/docs/70548/Narrative/>
57. American College of Radiology. ACR Appropriateness Criteria® Abdominal Aortic Aneurysm Follow-up (Without Repair). American College of Radiology. Updated 2018. Accessed November 5, 2021. <https://acsearch.acr.org/docs/3102391/Narrative/>
58. Hall C, Clarke L, Pal A, et al. A Review of the Role of Carcinoembryonic Antigen in Clinical Practice. *Ann Coloproctol*. Dec 2019;35(6):294-305. doi:10.3393/ac.2019.11.13
59. Carrier M, Lazo-Langner A, Shivakumar S, et al. Screening for Occult Cancer in Unprovoked Venous Thromboembolism. *N Engl J Med*. Aug 20 2015;373(8):697-704. doi:10.1056/NEJMoa1506623

60. Fernandes CJ, Morinaga LTK, Alves JJJ, et al. Cancer-associated thrombosis: the when, how and why. *Eur Respir Rev*. Mar 31 2019;28(151):doi:10.1183/16000617.0119-2018
61. Jara-Palomares L, Otero R, Jimenez D, et al. Development of a Risk Prediction Score for Occult Cancer in Patients With VTE. *Chest*. Mar 2017;151(3):564-571. doi:10.1016/j.chest.2016.10.025
62. Sundermann B, Schröder JB, Warnecke T, et al. Imaging Workup of Suspected Classical Paraneoplastic Neurological Syndromes: A Systematic Review and Retrospective Analysis of (18)F-FDG-PET-CT. *Acad Radiol*. Oct 2017;24(10):1195-1202. doi:10.1016/j.acra.2017.03.022
63. Gaitini D, Beck Razi N, Mor Yosef D, et al. Diagnosing acute appendicitis in adults: accuracy of color Doppler sonography and MDCT compared with surgery and clinical follow-up. *AJR Am J Roentgenol*. May 2008;190(5):1300-6. doi:10.2214/ajr.07.2955
64. Keyzer C, Zalcmán M, De Maertelaer V, et al. Comparison of US and unenhanced multi-detector row CT in patients suspected of having acute appendicitis. *Radiology*. Aug 2005;236(2):527-34. doi:10.1148/radiol.2362040984
65. Cappello M, Morreale GC. The Role of Laboratory Tests in Crohn's Disease. *Clin Med Insights Gastroenterol*. 2016;9:51-62. doi:10.4137/CGast.S38203
66. Robinson A, Light D, Kasim A, Nice C. A systematic review and meta-analysis of the role of radiology in the diagnosis of occult inguinal hernia. *Surg Endosc*. Jan 2013;27(1):11-8. doi:10.1007/s00464-012-2412-3
67. Miller J, Cho J, Michael MJ, Saouaf R, Towfigh S. Role of imaging in the diagnosis of occult hernias. *JAMA Surg*. Oct 2014;149(10):1077-80. doi:10.1001/jamasurg.2014.484
1. Lehtimäki TT, Valtonen H, Miettinen P, Juvonen P, Paajanen H, Vanninen R. A randomised clinical trial of routine versus selective CT imaging in acute abdomen: Impact of patient age on treatment costs and hospital resource use. *Eur J Radiol*. Feb 2017;87:1-7. doi:10.1016/j.ejrad.2016.11.031
2. American College of Radiology. ACR Appropriateness Criteria® Postmenopausal Acute Pelvic Pain. American College of Radiology (ACR). Updated 2020. Accessed March 21, 2022. <https://acsearch.acr.org/docs/3102398/Narrative/>
3. American College of Radiology. ACR Appropriateness Criteria® Palpable Abdominal Mass-Suspected Neoplasm. American College of Radiology. Updated 2019. Accessed November 8, 2021. <https://acsearch.acr.org/docs/69473/Narrative/>
4. American College of Radiology. ACR Appropriateness Criteria® Soft-Tissue Masses. American College of Radiology. Updated 2017. Accessed November 2, 2021. <https://acsearch.acr.org/docs/69434/Narrative/>
5. Smereka P, Doshi AM, Ream JM, Rosenkrantz AB. The American College of Radiology Incidental Findings Committee Recommendations for Management of Incidental Lymph Nodes: A Single-Center Evaluation. *Acad Radiol*. May 2017;24(5):603-608. doi:10.1016/j.acra.2016.12.009
6. Kaya C, Bozkurt E, Yazıcı P, İdiz UO, Tanal M, Mihmanlı M. Approach to the diagnosis and treatment of mesenteric panniculitis from the surgical point of view. *Turk J Surg*. 2018;34(2):121-124. doi:10.5152/turkjsurg.2018.3881
7. McLaughlin PD, Filippone A, Maher MM. The "misty mesentery": mesenteric panniculitis and its mimics. *AJR Am J Roentgenol*. Feb 2013;200(2):W116-23. doi:10.2214/ajr.12.8493
8. van Putte-Katier N, van Bommel EF, Elgersma OE, Hendriksz TR. Mesenteric panniculitis: prevalence, clinicoradiological presentation and 5-year follow-up. *Br J Radiol*. Dec 2014;87(1044):20140451. doi:10.1259/bjr.20140451

9. Helbling R, Conficconi E, Wyttenbach M, et al. Acute Nonspecific Mesenteric Lymphadenitis: More Than "No Need for Surgery". *Biomed Res Int*. 2017;2017:9784565. doi:10.1155/2017/9784565
10. Bourgioti C, Chatoupis K, Mouloupoulos LA. Current imaging strategies for the evaluation of uterine cervical cancer. *World J Radiol*. Apr 28 2016;8(4):342-54. doi:10.4329/wjr.v8.i4.342
11. NCCN Imaging Appropriate Use Criteria™. National Comprehensive Cancer Network (NCCN). Updated 2021. Accessed November 4, 2021. <https://www.nccn.org/professionals/imaging/default.aspx>
12. Greco FA, Oien K, Erlander M, et al. Cancer of unknown primary: progress in the search for improved and rapid diagnosis leading toward superior patient outcomes. *Ann Oncol*. Feb 2012;23(2):298-304. doi:10.1093/annonc/mdr306
13. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Prostate Cancer Early Detection Version 2.2021. National Comprehensive Cancer Network (NCCN). Updated July 14, 2021. Accessed July 20, 2021. https://www.nccn.org/professionals/physician_gls/pdf/prostate_detection.pdf
14. Cartwright SL, Knudson MP. Diagnostic imaging of acute abdominal pain in adults. *Am Fam Physician*. Apr 1 2015;91(7):452-9.
15. American College of Radiology. ACR Appropriateness Criteria® Left Lower Quadrant Pain-Suspected Diverticulitis. American College of Radiology. Updated 2018. Accessed March 18, 2022. <https://acsearch.acr.org/docs/69356/Narrative/>
16. Linzay CD, Pandit S. Acute Diverticulitis. StatPearls Publishing. Updated August 11, 2021. Accessed November 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK459316/>
17. American College of Radiology. ACR Appropriateness Criteria® Right Lower Quadrant Pain-Suspected Appendicitis. American College of Radiology. Updated 2018. Accessed March 21, 2022. <https://acsearch.acr.org/docs/69357/narrative/>
18. Peery AF, Shaukat A, Strate LL. AGA Clinical Practice Update on Medical Management of Colonic Diverticulitis: Expert Review. *Gastroenterology*. Feb 2021;160(3):906-911.e1. doi:10.1053/j.gastro.2020.09.059
19. American College of Surgeons. Five things physicians and patients should question: Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option. Choosing Wisely Initiative ABIM Foundation. Updated 2021. Accessed November 5, 2021. <https://www.choosingwisely.org/clinician-lists/american-college-surgeons-computed-tomography-to-evaluate-appendicitis-in-children/>
20. American Academy of Pediatrics. Five things physicians and patients should question: Avoid using computed tomography (CT scan) as the first-line imaging modality in the evaluation of suspected appendicitis in children. Choosing Wisely Initiative ABIM Foundation. Updated November 4, 2019. Accessed November 5, 2021. <https://www.choosingwisely.org/clinician-lists/aap-sosu-avoid-ct-scan-as-first-line-imaging-in-suspected-appendicitis/>
21. Baker RD. Acute abdominal pain. *Pediatrics in Review*. 2018;39(3):130-9.
22. Sanchez TR, Corwin MT, Davoodian A, Stein-Wexler R. Sonography of Abdominal Pain in Children: Appendicitis and Its Common Mimics. *J Ultrasound Med*. Mar 2016;35(3):627-35. doi:10.7863/ultra.15.04047
23. American College of Radiology. ACR Appropriateness Criteria® Suspected Appendicitis—Child. American College of Radiology. Updated 2018. Accessed March 21, 2022. <https://acsearch.acr.org/docs/3105874/Narrative/>

24. American College of Radiology. ACR Appropriateness Criteria® Acute Nonlocalized Abdominal Pain. American College of Radiology. Updated 2018. Accessed November 8, 2021.
<https://acsearch.acr.org/docs/69467/Narrative/>
25. Runowska M, Majewski D, Puszczewicz M. Retroperitoneal fibrosis - the state-of-the-art. *Reumatologia*. 2016;54(5):256-263. doi:10.5114/reum.2016.63667
26. American College of Radiology. ACR Appropriateness Criteria® Acute Pancreatitis. American College of Radiology. Updated 2019. Accessed November 5, 2021.
<https://acsearch.acr.org/docs/69468/Narrative/>
27. Vagvala SH, O'Connor SD. Imaging of abnormal liver function tests. *Clin Liver Dis (Hoboken)*. May 2018;11(5):128-134. doi:10.1002/cld.704
28. Leppäniemi A, Tolonen M, Tarasconi A, et al. 2019 WSES guidelines for the management of severe acute pancreatitis. *World J Emerg Surg*. 2019;14:27. doi:10.1186/s13017-019-0247-0
29. American College of Radiology. ACR Appropriateness Criteria® Crohn Disease. American College of Radiology. Updated 2019. Accessed November 5, 2021.
<https://acsearch.acr.org/docs/69470/Narrative/>
30. Lichtenstein GR, Loftus EV, Isaacs KL, Regueiro MD, Gerson LB, Sands BE. ACG Clinical Guideline: Management of Crohn's Disease in Adults. *Am J Gastroenterol*. Apr 2018;113(4):481-517. doi:10.1038/ajg.2018.27
31. Arif-Tiwari H, Taylor P, Kalb BT, Martin DR. Magnetic resonance enterography in inflammatory bowel disease. *Applied Radiology*. 2019;48(1):9-16.
32. Siddiki HA, Fidler JL, Fletcher JG, et al. Prospective comparison of state-of-the-art MR enterography and CT enterography in small-bowel Crohn's disease. *AJR Am J Roentgenol*. Jul 2009;193(1):113-21. doi:10.2214/ajr.08.2027
33. Rubin DT, Ananthakrishnan AN, Siegel CA, Sauer BG, Long MD. ACG Clinical Guideline: Ulcerative Colitis in Adults. *Am J Gastroenterol*. Mar 2019;114(3):384-413. doi:10.14309/ajg.0000000000000152
34. Davis R, Jones JS, Barocas DA, et al. Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline. *J Urol*. Dec 2012;188(6 Suppl):2473-81. doi:10.1016/j.juro.2012.09.078
35. Sharp VJ, Barnes KT, Erickson BA. Assessment of asymptomatic microscopic hematuria in adults. *Am Fam Physician*. Dec 1 2013;88(11):747-54.
36. American College of Radiology. ACR Appropriateness Criteria® Hematuria. American College of Radiology. Updated 2019. Accessed March 21, 2022. <https://acsearch.acr.org/docs/69490/Narrative/>
37. Assimos D, Krambeck A, Miller NL, et al. Surgical Management of Stones: American Urological Association/Endourological Society Guideline, PART I. *J Urol*. Oct 2016;196(4):1153-60. doi:10.1016/j.juro.2016.05.090
38. Fulgham PF, Assimos DG, Pearle MS, Preminger GM. Clinical effectiveness protocols for imaging in the management of ureteral calculous disease: AUA technology assessment. *J Urol*. Apr 2013;189(4):1203-13. doi:10.1016/j.juro.2012.10.031
39. Bonkat G, Pickard R, Baroletti R, et al. EAU guidelines on urological infections. European Association of Urology (EAU). Updated March 2017. Accessed November 5, 2021.
<https://uroweb.org/wp-content/uploads/Urological-Infections-2017-pocket.pdf>
40. Grabe M, Bartoletti R, Bjerkklund Johansen TE, et al. Guidelines on urological infections. European Association of Urology (EAU). Updated March 2015. Accessed November 5, 2021.
https://uroweb.org/wp-content/uploads/18-Urological-Infections_LR.pdf

41. American College of Radiology. ACR Appropriateness Criteria® Acute Pyelonephritis American College of Radiology. Updated 2018. Accessed March 21, 2022.
<https://acsearch.acr.org/docs/69489/Narrative/>
42. Anger J, Lee U, Ackerman AL, et al. Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline (2019). American Urological Association (AUA). Updated 2019. Accessed November 5, 2021. <https://www.auanet.org/guidelines/recurrent-uti>
43. Schaeffer AJ, Nicolle LE. CLINICAL PRACTICE. Urinary Tract Infections in Older Men. *N Engl J Med*. Feb 11 2016;374(6):562-71. doi:10.1056/NEJMcp1503950
44. Paulson EK, Thompson WM. Review of small-bowel obstruction: the diagnosis and when to worry. *Radiology*. May 2015;275(2):332-42. doi:10.1148/radiol.15131519
45. American College of Radiology. ACR Appropriateness Criteria® Suspected Small-Bowel Obstruction. American College of Radiology. Updated 2019. Accessed November 5, 2021.
<https://acsearch.acr.org/docs/69476/Narrative/>
46. Dhatt HS, Behr SC, Miracle A, Wang ZJ, Yeh BM. Radiological Evaluation of Bowel Ischemia. *Radiol Clin North Am*. Nov 2015;53(6):1241-54. doi:10.1016/j.rcl.2015.06.009
47. American College of Radiology. ACR Appropriateness Criteria® Imaging of Mesenteric Ischemia. American College of Radiology. Updated 2018. Accessed November 5, 2021.
<https://acsearch.acr.org/docs/70909/Narrative/>
48. Pasha SF, Leighton JA. Evidence-Based Guide on Capsule Endoscopy for Small Bowel Bleeding. *Gastroenterol Hepatol (N Y)*. Feb 2017;13(2):88-93.
49. Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. Jan 2018;67(1):2-77.e2. doi:10.1016/j.jvs.2017.10.044
50. Uberoi R, Tsetis D, Shrivastava V, Morgan R, Belli AM. Standard of practice for the interventional management of isolated iliac artery aneurysms. *Cardiovasc Intervent Radiol*. Feb 2011;34(1):3-13. doi:10.1007/s00270-010-0055-0
51. American College of Radiology. ACR Appropriateness Criteria® Major Blunt Trauma. American College of Radiology. Updated 2019. Accessed November 30, 2021.
<https://acsearch.acr.org/docs/3102405/Narrative/>
52. Halligan S, Parker SG, Plumb AA, Windsor ACJ. Imaging complex ventral hernias, their surgical repair, and their complications. *Eur Radiol*. Aug 2018;28(8):3560-3569. doi:10.1007/s00330-018-5328-z
53. Cheson BD, Fisher RI, Barrington SF, et al. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: the Lugano classification. *J Clin Oncol*. Sep 20 2014;32(27):3059-68. doi:10.1200/jco.2013.54.8800
54. Gaddey HL, Holder K. Unintentional weight loss in older adults. *Am Fam Physician*. May 1 2014;89(9):718-22.
55. Bosch X, Monclús E, Escoda O, et al. Unintentional weight loss: Clinical characteristics and outcomes in a prospective cohort of 2677 patients. *PLoS One*. 2017;12(4):e0175125. doi:10.1371/journal.pone.0175125
56. Wong CJ. Involuntary weight loss. *Med Clin North Am*. May 2014;98(3):625-43. doi:10.1016/j.mcna.2014.01.012
57. Chen YJ, Wu CY, Huang YL, Wang CB, Shen JL, Chang YT. Cancer risks of dermatomyositis and polymyositis: a nationwide cohort study in Taiwan. *Arthritis Res Ther*. 2010;12(2):R70. doi:10.1186/ar2987

58. Dalakas MC. Inflammatory Muscle Diseases. *N Engl J Med*. Jul 23 2015;373(4):393-4. doi:10.1056/NEJMc1506827
59. Titulaer MJ, Soffietti R, Dalmau J, et al. Screening for tumours in paraneoplastic syndromes: report of an EFNS task force. *Eur J Neurol*. Jan 2011;18(1):19-e3. doi:10.1111/j.1468-1331.2010.03220.x
60. Hoshino Y, Machida M, Shimano Si, et al. Unilateral Leg Swelling: Differential Diagnostic Issue Other than Deep Vein Thrombosis. *Journal of General and Family Medicine*. 2016;17(4):311-314.
61. Brown I, Finnigan NA. Fever of Unknown Origin. StatPearls Publishing. Updated August 25, 2021. Accessed November 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK532265/>
62. Ibrahim W, Al Safran Z, Hasan H, Zeid WA. Endovascular management of may-thurner syndrome. *Ann Vasc Dis*. 2012;5(2):217-21. doi:10.3400/avd.cr.12.00007
63. Wu WL, Tzeng WS, Wu RH, et al. Comprehensive MDCT evaluation of patients with suspected May-Thurner syndrome. *AJR Am J Roentgenol*. Nov 2012;199(5):W638-45. doi:10.2214/ajr.11.8040
64. Gleason A, Bishop K, Xi Y, Fetzer DT. Isolated Right-Sided Varicocele: Is Further Workup Necessary? *AJR Am J Roentgenol*. Apr 2019;212(4):802-807. doi:10.2214/ajr.18.20077
65. Moore CL, Carpenter CR, Heilbrun ME, et al. Imaging in Suspected Renal Colic: Systematic Review of the Literature and Multispecialty Consensus. *J Am Coll Radiol*. Sep 2019;16(9 Pt A):1132-1143. doi:10.1016/j.jacr.2019.04.004
66. American College of Radiology. ACR Appropriateness Criteria® Recurrent Lower Urinary Tract Infections in Females. American College of Radiology (ACR). Updated 2020. Accessed November 5, 2021. <https://acsearch.acr.org/docs/69491/Narrative/>
67. American College of Radiology. ACR Appropriateness Criteria® Abdominal Aortic Aneurysm: Interventional Planning and Follow-up. American College of Radiology. Updated 2017. Accessed November 5, 2021. <https://acsearch.acr.org/docs/70548/Narrative/>
68. American College of Radiology. ACR Appropriateness Criteria® Abdominal Aortic Aneurysm Follow-up (Without Repair). American College of Radiology. Updated 2018. Accessed November 5, 2021. <https://acsearch.acr.org/docs/3102391/Narrative/>
69. Hall C, Clarke L, Pal A, et al. A Review of the Role of Carcinoembryonic Antigen in Clinical Practice. *Ann Coloproctol*. Dec 2019;35(6):294-305. doi:10.3393/ac.2019.11.13
70. Carrier M, Lazo-Langner A, Shivakumar S, et al. Screening for Occult Cancer in Unprovoked Venous Thromboembolism. *N Engl J Med*. Aug 20 2015;373(8):697-704. doi:10.1056/NEJMoa1506623
71. Fernandes CJ, Morinaga LTK, Alves JIJ, et al. Cancer-associated thrombosis: the when, how and why. *Eur Respir Rev*. Mar 31 2019;28(151)doi:10.1183/16000617.0119-2018
72. Jara-Palomares L, Otero R, Jimenez D, et al. Development of a Risk Prediction Score for Occult Cancer in Patients With VTE. *Chest*. Mar 2017;151(3):564-571. doi:10.1016/j.chest.2016.10.025
73. Sundermann B, Schröder JB, Warnecke T, et al. Imaging Workup of Suspected Classical Paraneoplastic Neurological Syndromes: A Systematic Review and Retrospective Analysis of (18)F-FDG-PET-CT. *Acad Radiol*. Oct 2017;24(10):1195-1202. doi:10.1016/j.acra.2017.03.022
74. Gaitini D, Beck-Razi N, Mor-Yosef D, et al. Diagnosing acute appendicitis in adults: accuracy of color Doppler sonography and MDCT compared with surgery and clinical follow-up. *AJR Am J Roentgenol*. May 2008;190(5):1300-6. doi:10.2214/ajr.07.2955
75. Keyzer C, Zalcmán M, De Maertelaer V, et al. Comparison of US and unenhanced multi-detector row CT in patients suspected of having acute appendicitis. *Radiology*. Aug 2005;236(2):527-34. doi:10.1148/radiol.2362040984

76. Cappello M, Morreale GC. The Role of Laboratory Tests in Crohn's Disease. *Clin Med Insights Gastroenterol*. 2016;9:51-62. doi:10.4137/CGast.S38203
77. Robinson A, Light D, Kasim A, Nice C. A systematic review and meta-analysis of the role of radiology in the diagnosis of occult inguinal hernia. *Surg Endosc*. Jan 2013;27(1):11-8. doi:10.1007/s00464-012-2412-3
78. Miller J, Cho J, Michael MJ, Saouaf R, Towfigh S. Role of imaging in the diagnosis of occult hernias. *JAMA Surg*. Oct 2014;149(10):1077-80. doi:10.1001/jamasurg.2014.484

ADDITIONAL RESOURCES

1. American College of Emergency Physicians. Ten things physicians and patients should question: Avoid ordering CT of the abdomen and pelvis in young otherwise healthy emergency department (ED) patients (age <50) with known histories of kidney stones, or ureterolithiasis, presenting with symptoms consistent with uncomplicated renal colic. Choosing Wisely Initiative ABIM Foundation. Updated 2018. Accessed November 5, 2021. <https://www.choosingwisely.org/clinician-lists/acep-ct-of-abdomen-and-pelvis-for-ed-patients-under-50/>
2. Becknell B, Schober M, Korbel L, Spencer JD. The diagnosis, evaluation and treatment of acute and recurrent pediatric urinary tract infections. *Expert Rev Anti Infect Ther*. Jan 2015;13(1):81-90. doi:10.1586/14787210.2015.986097
3. Brisbane W, Bailey MR, Sorensen MD. An overview of kidney stone imaging techniques. *Nat Rev Urol*. Nov 2016;13(11):654-662. doi:10.1038/nrurol.2016.154
4. Bruix J, Sherman M. Management of hepatocellular carcinoma: an update. *Hepatology*. Mar 2011;53(3):1020-2. doi:10.1002/hep.24199
5. Coakley FV, Oto A, Alexander LF, et al. ACR Appropriateness Criteria(®) Prostate Cancer- Pretreatment Detection, Surveillance, and Staging. *J Am Coll Radiol*. May 2017;14(5s):S245-s257. doi:10.1016/j.jacr.2017.02.026
6. Darcy M. Evaluation and management of transjugular intrahepatic portosystemic shunts. *AJR Am J Roentgenol*. Oct 2012;199(4):730-6. doi:10.2214/ajr.12.9060
7. Dariushnia SR, Haskal ZJ, Midia M, et al. Quality Improvement Guidelines for Transjugular Intrahepatic Portosystemic Shunts. *J Vasc Interv Radiol*. Jan 2016;27(1):1-7. doi:10.1016/j.jvir.2015.09.018
8. Dason S, Dason JT, Kapoor A. Guidelines for the diagnosis and management of recurrent urinary tract infection in women. *Can Urol Assoc J*. Oct 2011;5(5):316-22. doi:10.5489/cuaj.11214
9. Farsad K, Kolbeck KJ. Clinical and radiologic evaluation of patients before TIPS creation. *AJR Am J Roentgenol*. Oct 2014;203(4):739-45. doi:10.2214/ajr.14.12999
10. Fontenelle LF, Sarti TD. Kidney Stones: Treatment and Prevention. *Am Fam Physician*. Apr 15 2019;99(8):490-496.
11. Gerson LB, Fidler JL, Cave DR, Leighton JA. ACG Clinical Guideline: Diagnosis and Management of Small Bowel Bleeding. *Am J Gastroenterol*. Sep 2015;110(9):1265-87; quiz 1288. doi:10.1038/ajg.2015.246
12. Harder JN, Hany TF, von Schulthess GK, Goerres GW. Pathologies of the lower abdomen and pelvis: PET/CT reduces interpretation errors due to urinary contamination. *Clin Imaging*. Jan-Feb 2008;32(1):16-21. doi:10.1016/j.clinimag.2007.07.004

13. Jhang JF, Kuo HC. Recent advances in recurrent urinary tract infection from pathogenesis and biomarkers to prevention. *Ci Ji Yi Xue Za Zhi*. Jul-Sep 2017;29(3):131-137. doi:10.4103/tcmj.tcmj 53 17
14. Khosa F, Krinsky G, Macari M, Yucel EK, Berland LL. Managing incidental findings on abdominal and pelvic CT and MRI, Part 2: white paper of the ACR Incidental Findings Committee II on vascular findings. *J Am Coll Radiol*. Oct 2013;10(10):789-94. doi:10.1016/j.jacr.2013.05.021
15. Krajewski S, Brown J, Phang PT, Raval M, Brown CJ. Impact of computed tomography of the abdomen on clinical outcomes in patients with acute right lower quadrant pain: a meta-analysis. *Can J Surg*. Feb 2011;54(1):43-53. doi:10.1503/cjs.023509
16. Kranokpiraksa P, Kaufman JA. Follow-up of endovascular aneurysm repair: plain radiography, ultrasound, CT/CT angiography, MR imaging/MR angiography, or what? *J Vasc Interv Radiol*. Jun 2008;19(6 Suppl):S27-36. doi:10.1016/j.jvir.2008.03.009
17. Kroese LF, Sneiders D, Kleinrensink GJ, Muysoms F, Lange JF. Comparing different modalities for the diagnosis of incisional hernia: a systematic review. *Hernia*. Apr 2018;22(2):229-242. doi:10.1007/s10029-017-1725-5
18. Kumar Y, Hooda K, Li S, Goyal P, Gupta N, Adeb M. Abdominal aortic aneurysm: pictorial review of common appearances and complications. *Ann Transl Med*. Jun 2017;5(12):256. doi:10.21037/atm.2017.04.32
19. Lassandro F, Iasiello F, Pizza NL, et al. Abdominal hernias: Radiological features. *World J Gastrointest Endosc*. Jun 16 2011;3(6):110-7. doi:10.4253/wjge.v3.i6.110
20. Leslie SW, Sajjad H, Murphy PB. Renal Calculi. StatPearls Publishing. Updated September 17, 2021. Accessed November 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK442014/>
21. Marquardt JU, Nguyen-Tat M, Galle PR, Wörns MA. Surveillance of Hepatocellular Carcinoma and Diagnostic Algorithms in Patients with Liver Cirrhosis. *Visc Med*. Apr 2016;32(2):110-5. doi:10.1159/000445407
22. Murphy KP, O'Connor OJ, Maher MM. Adult abdominal hernias. *AJR Am J Roentgenol*. Jun 2014;202(6):W506-11. doi:10.2214/ajr.13.12071
23. Mathur AK, Whitaker A, Kolli H, Nguyen T. Acute Pancreatitis with Normal Serum Lipase and Amylase: A Rare Presentation. *JOP J Pancreas (Online)*. 2016;17(1):98-101.
24. Neville AM, Paulson EK. MDCT of acute appendicitis: value of coronal reformations. *Abdom Imaging*. Jan-Feb 2009;34(1):42-8. doi:10.1007/s00261-008-9415-5
25. Panizza PS, Viana PC, Horvat N, et al. Inflammatory Bowel Disease: Current Role of Imaging in Diagnosis and Detection of Complications: Gastrointestinal Imaging. *Radiographics*. Mar-Apr 2017;37(2):701-702. doi:10.1148/rg.2017160050
26. Patil M, Sheth KA, Adarsh CK. Elevated alpha fetoprotein, no hepatocellular carcinoma. *J Clin Exp Hepatol*. Jun 2013;3(2):162-4. doi:10.1016/j.jceh.2013.02.246
27. Pickhardt PJ, Lawrence EM, Pooler BD, Bruce RJ. Diagnostic performance of multidetector computed tomography for suspected acute appendicitis. *Ann Intern Med*. Jun 21 2011;154(12):789-96, w-291. doi:10.7326/0003-4819-154-12-201106210-00006
28. Reese AC, Pierorazio PM, Han M, Partin AW. Contemporary evaluation of the National Comprehensive Cancer Network prostate cancer risk classification system. *Urology*. Nov 2012;80(5):1075-9. doi:10.1016/j.urology.2012.07.040
29. Seminerio JL, Aggarwal G, Sweetser S. 26-year-old man with recurrent urinary tract infections. *Mayo Clin Proc*. Jun 2011;86(6):557-60. doi:10.4065/mcp.2010.0600

30. Simons MP, Smietanski M, Bonjer HJ, et al. International guidelines for groin hernia management. *Hernia*. Feb 2018;22(1):1-165. doi:10.1007/s10029-017-1668-x
31. Stephens N, Bharwani N, Heenan S. Prostate cancer staging. *Imaging*. 2008;20(2):112-121.
32. Tan CH, Low S-CA, Thng CH. APASL and AASLD Consensus Guidelines on Imaging Diagnosis of Hepatocellular Carcinoma: A Review. *Int J Hepatol*. 2011;2011:519783-519783. doi:10.4061/2011/519783
33. Thompson IM, Goodman PJ, Tangen CM, et al. The influence of finasteride on the development of prostate cancer. *N Engl J Med*. Jul 17 2003;349(3):215-24. doi:10.1056/NEJMoa030660
34. Tonolini M, Ippolito S. Cross-sectional imaging of complicated urinary infections affecting the lower tract and male genital organs. *Insights Imaging*. Oct 2016;7(5):689-711. doi:10.1007/s13244-016-0503-8
35. Tosoian JJ, Chappidi M, Feng Z, et al. Prediction of pathological stage based on clinical stage, serum prostate-specific antigen, and biopsy Gleason score: Partin Tables in the contemporary era. *BJU Int*. May 2017;119(5):676-683. doi:10.1111/bju.13573
36. Trotter SC, Sroa N, Winkelmann RR, Olencki T, Bechtel M. A Global Review of Melanoma Follow-up Guidelines. *J Clin Aesthet Dermatol*. Sep 2013;6(9):18-26.
37. Tzartzeva K, Obi J, Rich NE, et al. Surveillance Imaging and Alpha Fetoprotein for Early Detection of Hepatocellular Carcinoma in Patients With Cirrhosis: A Meta-analysis. *Gastroenterology*. May 2018;154(6):1706-1718.e1. doi:10.1053/j.gastro.2018.01.064
38. Final Recommendation Statement Colorectal Cancer: Screening U.S. Preventive Services Task Force (USPSTF). Updated May 18, 2021. Accessed November 5, 2021. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening>
39. Vikram R, Sandler CM, Ng CS. Imaging and staging of transitional cell carcinoma: part 1, lower urinary tract. *AJR Am J Roentgenol*. Jun 2009;192(6):1481-7. doi:10.2214/ajr.08.1318

Reviewed / Approved by NIA Clinical Guideline Committee

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

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